

## CLAIMS

*What is claimed is:*

1. A Home Agent supporting Mobile IP and being capable of allocating one or more networks to a mobile router which registers with the Home Agent, the Home Agent comprising:

a processor; and

a memory, at least one of the processor and the memory being adapted for:

receiving a registration request packet from the mobile router, the registration request packet including a network allocation extension indicating one or more networks being requested by the mobile router from the Home Agent;

allocating the one or more networks to the mobile router corresponding to the network allocation extension of the registration request packet; and

sending a registration reply packet to the mobile router, the registration reply including a network allocation extension identifying the one or more networks allocated to the mobile router.

2. The Home Agent as recited in claim 1, wherein at least one of the processor and the memory are further adapted for:

authenticating the mobile router prior to allocating the one or more networks to the mobile router and sending the registration reply packet to the mobile router.

3. The Home Agent as recited in claim 1, wherein the network allocation extension indicates a number of subnets being requested by the mobile router.

4. The Home Agent as recited in claim 1, wherein the network allocation extension indicates a size of the one or more networks being requested by the mobile router from the

Home Agent.

5. The Home Agent as recited in claim 1, wherein allocating the one or more networks to the mobile router corresponding to the network allocation extension of the registration request packet comprises:

allocating the one or more networks from a local pool of available networks, the local pool being managed by the Home Agent.

6. The Home Agent as recited in claim 1, wherein allocating the one or more networks to the mobile router corresponding to the network allocation extension of the registration request packet comprises:

allocating the one or more networks from a DHCP server that manages a pool of available networks.

7. The Home Agent as recited in claim 1, wherein allocating the one or more networks to the mobile router corresponding to the network allocation extension of the registration request packet comprises:

allocating the one or more networks from a AAA server that manages a pool of available networks.

8. The Home Agent as recited in claim 1, wherein at least one of the processor and the memory are further adapted for:

updating a routing table to include one or more entries for the one or more networks that are allocated to the mobile router, wherein each entry in the routing table includes a care-of address associated with the one or more networks.

9. The Home Agent as recited in claim 8, wherein at least one of the processor and

the memory are further adapted for:

updating the routing table to remove the one or more entries when a lifetime of the mobile router has expired.

10. The Home Agent as recited in claim 8, wherein at least one of the processor and the memory are further adapted for:

receiving a deregistration request from the mobile router; and

updating the routing table to remove the one or more networks from the routing table.

11. The Home Agent as recited in claim 8, wherein at least one of the processor and the memory are further adapted for:

receiving a deregistration request from the mobile router; and

updating the routing table to remove the one or more entries from the routing table.

12. The Home Agent as recited in claim 1, wherein at least one of the processor and the memory are further adapted for:

updating a mobility binding table to associate the mobile router with a care-of address.

13. The Home Agent as recited in claim 12, wherein at least one of the processor and the memory are further adapted for:

updating the mobility binding table to remove the association between the mobile router and the care-of address when a lifetime of the mobile router has expired.

14. The Home Agent as recited in claim 8, wherein at least one of the processor and the memory are further adapted for:

receiving a deregistration request from the mobile router; and

updating the mobility binding table to remove the association between the mobile router and the care-of address.

15. The Home Agent as recited in claim 1, wherein at least one of the processor and the memory are further adapted for:

deallocating the one or more networks previously allocated to the mobile router when a lifetime of the mobile router has expired.

16. The Home Agent as recited in claim 15, wherein deallocating the one or more networks previously allocated to the mobile router comprises:

replacing the one or more networks to a pool of available networks.

17. The Home Agent as recited in claim 1, wherein at least one of the processor and the memory are further adapted for:

receiving a deregistration request from the mobile router; and

deallocating the one or more networks previously allocated to the mobile router.

18. The Home Agent as recited in claim 17, wherein deallocating the one or more networks previously allocated to the mobile router comprises:

replacing the one or more networks to a pool of available networks.

19. The Home Agent as recited in claim 17, wherein at least one of the processor and

the memory are further adapted for:

sending a deregistration reply to the mobile router.

20. A mobile router supporting Mobile IP and being capable of requesting one or more networks during registration with a Home Agent, the mobile router comprising:

a processor; and

a memory, at least one of the processor and the memory being adapted for:

composing a registration request packet, the registration request packet including a network allocation extension indicating one or more networks being requested by the mobile router from a Home Agent;

sending the registration request packet to the Home Agent; and

receiving a registration reply packet from the Home Agent, the registration reply including a network allocation extension identifying one or more networks allocated to the mobile router by the Home Agent.

21. The mobile router as recited in claim 20, wherein the network allocation extension indicates a number of subnets being requested by the mobile router.

22. The mobile router as recited in claim 20, wherein the network allocation extension indicates a size of the one or more networks being requested by the mobile router from the Home Agent.

23. The mobile router as recited in claim 20, wherein at least one of the processor and the memory are further adapted for:

detecting a Foreign Agent prior to composing and sending the registration request packet to the Home Agent.

24. The mobile router as recited in claim 20, wherein at least one of the processor and the memory are further adapted for:

selecting from the one or more networks allocated to the mobile router by the Home Agent an IP address; and

configuring an interface of the mobile router with the IP address such that a network coupled to the interface is identified by the IP address.

25. The mobile router as recited in claim 24, wherein at least one of the processor and the memory are further adapted for:

deconfiguring the interface of the mobile router such that the interface is not identified by the IP address.

26. The mobile router as recited in claim 25, wherein deconfiguring the interface is performed when a lifetime of the mobile router has expired.

27. The mobile router as recited in claim 25, wherein at least one of the processor and the memory are further adapted for:

sending a deregistration request to the Home Agent prior to deconfiguring the interface of the mobile router.

28. The mobile router as recited in claim 20, wherein at least one of the processor and the memory are further adapted for:

adding the one or more networks identified in the network allocation extension to a private DHCP pool available to the mobile router.

29. The mobile router as recited in claim 28, wherein at least one of the processor and the memory are further adapted for:

removing the one or more networks from the private DHCP pool available to the mobile router.

30. The mobile router as recited in claim 29, wherein removing the one or more networks from the private DHCP pool available to the mobile router is performed when a lifetime of the mobile router has expired.

31. The mobile router as recited in claim 29, wherein at least one of the processor and the memory are further adapted for:

sending a deregistration request to the Home Agent prior to removing the one or more networks from the private DHCP pool available to the mobile router.

32. The mobile router as recited in claim 28, wherein at least one of the processor and the memory are further adapted for:

updating a registration table to indicate a lifetime granted during registration of the mobile router with the Home Agent.

33. The mobile router as recited in claim 32, wherein at least one of the processor and the memory are further adapted for:

deleting an entry from the registration table when the lifetime has expired.

34. The mobile router as recited in claim 20, wherein at least one of the processor and the memory are further adapted for:

sending a deregistration request to the Home Agent.

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35. The mobile router as recited in claim 34, wherein at least one of the processor and the memory are further adapted for:

receiving a deregistration reply from the Home Agent.

36. A computer readable medium for implementing a Home Agent supporting Mobile IP, the Home Agent being capable of allocating one or more networks to a mobile router which registers with the Home Agent, the computer readable medium comprising the following instructions:

instructions for receiving a registration request packet from the mobile router, the registration request packet including a network allocation extension indicating one or more networks being requested by the mobile router from the Home Agent;

instructions for allocating the one or more networks to the mobile router corresponding to the network allocation extension of the registration request packet; and

instructions for sending a registration reply packet to the mobile router, the registration reply including a network allocation extension identifying the one or more networks allocated to the mobile router.

37. A Home Agent supporting Mobile IP, the Home Agent being capable of allocating one or more networks to a mobile router which registers with the Home Agent, comprising:

means for receiving a registration request packet from the mobile router, the registration request packet including a network allocation extension indicating one or more networks being requested by the mobile router from the Home Agent;

means for allocating the one or more networks to the mobile router corresponding to the network allocation extension of the registration request packet; and

means for sending a registration reply packet to the mobile router, the registration reply including a network allocation extension identifying the one or more networks allocated to the mobile router.

38. In a Home Agent supporting Mobile IP, a method of allocating one or more networks to a mobile router which registers with the Home Agent, comprising:

receiving a registration request packet from the mobile router, the registration request packet including a network allocation extension indicating one or more networks being requested by the mobile router from the Home Agent;

allocating the one or more networks to the mobile router corresponding to the network allocation extension of the registration request packet; and

sending a registration reply packet to the mobile router, the registration reply including a network allocation extension identifying the one or more networks allocated to the mobile router.

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